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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,555	05/08/2001	Jack Zhu	P52/SYCS-010	4035

959 7590 10/28/2004

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BOSTON, MA 02109

EXAMINER	
PHAN, MAN U	

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 10/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/851,555	ZHU ET AL.	
	Examiner	Art Unit	
	Man Phan	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 May 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,14-19,21-26,28-33,35-41 and 43-51* is/are rejected.

7)☒ Claim(s) *13,20,27,34 and 42* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 May 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The application of Zhu et al. for a "Method for restoring diversely routed circuits" filed 05/08/2001 has been examined. Claims 1-51 are pending in the application.

Claim Objections

2. Applicant is advised that should claim 10be found allowable, claim 11 will be objected to under 37 CFR 1.75 as being a substantial duplicated thereof. Appropriate correction is required.

3. Claims 1-12, 14-15 and 45-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agrawal et al. (US#6,763,190) in view of Manchester (US#5,793,745).

With respect to claims 1-6 and 45-51, Agrawal et al. (US#6,763,190) discloses a novel system and method for path restoration, fault detection and service restoration processing for the node, according to the essential features of the claims. Agrawal et al. (US#6,763,190) discloses in Fig. 1 a method for automatically provisioning the network from a service path to a restoration path after a failure occurs in the service path, comprising the steps of (a) receiving, at the node, an indication of the occurrence of the failure in the service path; (b) if the node is an intermediate node of the service path, then transmitting, by the node, a failure message to its next node along the service path; (c) if the node is the end node of the service path, then transmitting, by the node, a restore message to its previous node along the restoration path; and (d) if the node is an intermediate node of the restoration path, then

transmitting, by the node, a restore message to its previous node along the restoration path (See also Fig. 4; Col. 2, lines 12 plus and Col. 10, lines 20 plus).

However, Agrawal et al. (US#6,763,190) does not expressly disclose the receiving one or more triggers at one of a destination node and a source node of a first path. In the same field of endeavor, Manchester (US#5,793,745) discloses a trigger mechanism (612) connected to an output of the working facilities and responsive to the fault detector (608) and table (610) and configured to send triggers o terminating nodes. A coordination mechanism 614 may be connected to an output of the protection facilities and responsive to the fault detector 608 and table 610 to initiate switching in a headend switch. The coordination mechanism 614 may also be responsive to a received coordination signal or a trigger signal and configured to activate the facility selector. A trigger mechanism alerts downstream nodes for the need to initiate protection switching where the node detecting the failure is not the terminating node for one or more BPFs. That is, if BPFs pass through a node detecting a failure, a trigger mechanism is used to notify the end-points of the BPFs passing through the node. In FIG. 5C, for example, node D detects a failure on the CD link 550 and sends a trigger to nodes F and H, which are the end nodes for BPF CF and BPF CH, respectively (Col. 6, lines 57 plus). Manchester further teaches in Fig. 8 a flow chart 800 illustrated the protection bundling switching process performed by a node which does not directly detect the failure. Rather, this node "detects" the failure indirectly by receiving a trigger from another node (Col. 8, lines 1 plus).

Regarding claims 7-12 and 14, 15, Manchester (US#5,793,745) further teaches the protection switching in the network as illustrated in Fig. 4C, in which in addition to

terminating protected VPs, node D is a through node for protected VPs between nodes C and F and between nodes C and H. Node D, having detected a failure on the node C-D link 406, sends 4096 trigger cells 412 to node F and 4096 trigger cells to node H at the time it is sending the 4096 coordination cells to node C. Upon receipt of trigger cells 412, nodes F and H act in the same manner as node D with respect to node C in order to receive VPs from node C on the protection facilities. That is, nodes F and H each send 4096 coordination cells 414 to node C and each receives 4096 acknowledgment cells 416 from node C over the protection facilities. This reestablishes the VPs between node C and node F and node C and node H through the path including node G (Col. 3, lines 42 plus). Manchester further teaches in Fig. 5A,B illustrated a SONET/SDH network having protection bundling, in which assume a link failure occurs on link CD. Using the PB method, a link failure between nodes C and D would be detected at node D. Node D immediately sends one coordination cell along CPR CD representing all of the VPs within the PB which traverse BPF CD. Node D also sends one trigger cell to node F for BPF CF because BPF CF passes through node D. Upon receipt of the coordination cell from node D, node C sends one coordination acknowledgment cell back to node D along CPR CD and switches its working VPs associated with BPF CD to CPR CD. Node D receives the coordination acknowledgment cell from node C and begins receiving VPs from CPR CD. The working PB is now restored. When node F receives the trigger cells from node D, these nodes initiate the PB protection switching and restore the PB associated with BPF CF using the same method used for the PB terminating on node D (Col. 5, lines 39 plus and Col. 10, lines 5 plus).

One skilled in the art would have recognized the need for effectively and efficiently routing and path restoration in communication network, and would have applied Manchester's novel use of the trigger mechanism to detect and carry path failure conditions into Agrawal's teaching of the provisioning for the automatic restoration of communications. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Manchester's bundled protection switching in a wide area network background of the invention into Agrawal's network auto-provisioning and distributed restoration with the motivation being to provide a method and apparatus for restoring a diversely routed circuit in a mesh network.

4. Claims 16-19, 21-26, 28-33, 35-41, 43, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agrawal et al. (US#6,763,190) in view of Manchester (US#5,793,745) as applied to the claims above, and further in view of Fukushima et al. (US#6,205,562).

With respect to claims 16-19, 21-26, 28-33, 35-41, 43, 44, Agrawal et al. (US#6,763,190) and manchester (US#5,793,745) disclose the claims as discussed in paragraph 3 above. However, these claims differ from the claims above in that the claims require the path indicating a uni-directional/bi-directional failure. In the same field of endeavor, Fukushima et al. (US#6,205,562) discloses a method of path restoration in a compound ring network typically comprising two networks such as a UPSR (*Uni-directional Protection Switch Ring*) and a BLSR (*Bi-directional Line Switch Ring*) connected to each other. In particular, a path switching method and a path switching apparatus having a function for switching from a working path to a protection path starting from two adjacent

input nodes (and ending at a common path terminating node) as a normal line (an active path) by using a path switch in such a compound ring network (Figs. 1-4; Col. 3, lines 56 plus).

One skilled in the art would have recognized the need for effectively and efficiently routing and path restoration in communication network, and would have applied Fukushima's method of path restoration in switched ring node using uni-directional/bi-directional data transfer, and Manchester's novel use of the trigger mechanism to detect and carry path failure conditions into Agrawal's teaching of the provisioning for the automatic restoration of communications. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Fukushima's path switching method, path switching apparatus and nodes of UPSR, and Manchester's bundled protection switching in a wide area network background of the invention into Agrawal's network auto-provisioning and distributed restoration with the motivation being to provide a method and apparatus for restoring a diversely routed circuit in a mesh network.

Allowable Subject Matter

5. Claims 13, 20, 27, 34 and 42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for the indication of allowable subject matter: The closest prior art of record fails to disclose or suggest wherein the algorith calculates that a switch is required and that the switch has not already occurred, switching one of the source and destination nodes from the first path to a functional second path, as specifically recited in the claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Rochberger et al. (US#6,272,107) is cited to show the method of path restoration in an ATM network utilizing point to point switched virtual circuits.

The Agrawal et al. (US#2001/0038471) is cited to show the fault communication for network distributed restoration.

The McAllister et al. (US#6,215,765) is cited to show the SVC routing in network with static routing tables.

The Flanagan et al. (US#5,159,595) is cited to show the ring transmission system.

The Houji (US#5,832,197) is cited to show the alternate routing by increasing initially low QoS value of a selected alternate path during failure to user-specified value.

The Roorda et al. (US#6,643,464) is cited to show the constrained optical mesh protection for transmission systems.

The Saleh et al. (US#2003/0031127) is cited to show the best effort technique for virtual path restoration.

The Doverspike et al. (US#2002/0097671) is cited to show the method for selecting a restoration path in a mesh network.

The Allen (US#5,835,482) is cited to show the communication system and method providing optimal restoration of failed paths.

The Daruwalla et al. (US#6,269,452) is cited to show the system and method for fault recovery for a two line bi-directional ring network.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (571) 272-3149.

The examiner can normally be reached on Mon - Fri from 6:00 to 3:00 EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

8. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: (703) 305-9051, (for formal communications intended for entry)

Or: (703) 305-3988 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

Mphan

10/21/2004.

MAN U. PHAN
PRIMARY EXAMINER